

REMARKS

An Office Action was mailed on June 18, 2003. Claims 1-30 are pending.

Applicant is submitting herewith an IDS for the review and consideration of the Examiner.

Claims 1, 2, 4, 7 and 26 are rejected under 35 U.S.C. §102(b) as being anticipated by Oshima et al. (U.S. Patent 5,932,139). Claim 8 is rejected under 35 U.S.C. §103(a) as being unpatentable over Oshima et al. in view of Voser et al. (U.S. Patent 6,172,745). Claims 9-17 and 28-29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Oshima et al. in view of Hopwood (U.S. Patent 5,915,518). Claim 18 is rejected under 35 U.S.C. §103(a) as being unpatentable over Oshima et al., Voser et al. and Hopwood and further in view of Schwartz (U.S. Patent 6,371,374). Claims 19-24 and 30 are rejected under 35 U.S.C. §103(a) as being unpatentable over Oshima et al., Voser et al., Hopwood and Schwartz and further in view of Cherney (U.S. Patent Publication 2001/0006066). Claims 3 and 5-7 are rejected under 35 U.S.C. §103(a) as being unpatentable over Oshima et al. in view of Kaule et al. (U.S. Patent 4,451,521). Finally, claim 25 is rejected under 35 U.S.C. §103(a) as being unpatentable over Oshima et al. and Kaule et al. and further in view of Liang.

Responsive thereto, Applicant has amended the claims to define over the cited art of record. Specifically, claim 1 has been amended so that it is a combination of former claims 1 and 3 and includes the disclosure of page 5, paragraph "1." (from "Features of the Sensor System"), page 7, lines 1-2 of the specification and part of originally-filed claim 2. Reconsideration is respectfully requested.

Applicant respectfully submits that amended claim 1 is patentable over Oshima et al. as claim 1 is directed to a sensor for authenticity identification of luminescent signets on documents, wherein in order to identify the signet on a document the signet is equipped at least in subregions with a pigment which can be detected using the up-conversion effect and the sensor is adapted to use the up-conversion effect wherein the specific excitation wavelength is longer than the response wavelength. In fact and also admitted by the Examiner on page 3, paragraph 1 of the Office Action of June 18, 2003, Oshima et al.'s device is designed to use the

down-conversion effect, where the response pulse light is at a lower frequency than the excitation frequency.

Accordingly, Applicant respectfully submits that amended claim 1 and the claims dependent therefrom are patentable over Oshima et al. Thus, the §102(b) rejection should be withdrawn. It should be noted that claims 4 and 5 have been canceled, which claims were directed to the down-conversion effect and a detection on the same wavelength respectively.

On page 9 of the Office Action of June 18, 2003, the Examiner rejects claim 3 as being unpatentable over Oshima et al. '139 in combination with Kaule et al. '521. The Examiner cites Kaule et al. column 2, lines 40-47 stating that up-conversion materials are in principle known. Nevertheless, in column 2, lines 55-57, Kaule et al. also states that the rendering of security papers using up-conversion materials is not mentioned yet. In column 5, lines 37-40, Kaule et al. states that an up-conversion technique has restricted application, since the intensity of luminescence emission is relatively small. Use is only sensible in rigorous security papers and requires correspondingly substantial testing apparatus. This merely means that up-conversion effect materials exist and the luminescence emission is relatively small.

However, Kaule et al. '521 does not disclose a sensor. In fact Kaule et al. '521 teaches away from a combination with Oshima et al. A person skilled in the art therefore is well aware of the severe problems faced when it is desired to implement up-conversion pigments of Kaule et al. in a signet and that this will cause severe problems regarding the detection requirements of a sensor in a testing apparatus. In fact, the present inventor has also noted that the up-conversion embodiment is particularly difficult to be realized and therefore inventive as such. The selection of the response wavelength has to be very exact, i.e., up to 2 nm. The light intensity is magnitudes of order lower than the intensity available from a down-conversion effect. The filters, which have to be used to suppress the pretty strong straylight in an up-conversion device have to be in the order of 10^{-7} as one has to use open apertures to collect as much intensity as possible. This difficulty is not to be underestimated and a person skilled in the art therefore already would not use an up-conversion pigment suggested in Kaule et al. in an apparatus suggested by Oshima et al. In other words, a combination of Kaule et al. and Oshima et al. is merely hypothetical. A person skilled in the art would immediately recognize that a combination

of these documents is not possible as the down-conversion and up-conversion effect are so much different. Even if a combination would be exercised in a theoretical way proposed by the Examiner, the apparatus of Oshima would not work anymore as the apparatus of Oshima is adapted for an intensity level of a down-conversion effect. However the intensity of an up-conversion effect would be insufficient for an apparatus of Oshima '139.

Applicant further respectfully submits that a theoretical combination of Oshima et al. and Kaule et al. would not result in the claimed invention. In particular one has to recognize the disclosure of column 44, lines 42-45 and column 4, lines 29-34 of Oshima et al. The run speed of “not lower than 0.5m/s” disclosed therein is merely and explicitly limited to the down-conversion effect as this effect has sufficient intensity available for the detecting apparatus. According to Kaule et al., column 5, lines 37-40, this technique can not be transmitted to an apparatus using the up-conversion effect. In fact this is proven by Malmberg (U.S. Patent 4,047,033), a copy of which is being provided in the IDS filed herewith. Malmberg '033 corresponds to the German Offenlegungsschrift 2 547 768 cited in Kaule in column 2, line 41. As outlined in Malmberg '033, column 4, lines 33-40 and figure 3, column 4, lines 65 to column 5, line 13 and column 5, lines 55 to 58, Malmberg '033 explicitly needs an arrangement wherein a document has to be in rest in a correct check position, e.g. when the document is correctly inserted into a slot and is nearly in contact with the light emitting diode 5 and a photo diode 7 (Fig. 1 of Malmberg '033).

Thus, Applicant respectfully submits that a combination of Oshima et al. and Kaule et al. is simply not possible as it would result in a non-working apparatus. In particular, the run speed disclosed in Oshima, column 44, line 45 is specific for and merely restricted to an apparatus using the down-conversion effect. As proven by Malmberg '033 and Kaule et al. '521 in column 5, lines 37-40, an apparatus using the up-conversion effect has restricted application since the intensity of luminescence emission is relatively small. A document can only be tested if it is in rest as disclosed by Malmberg '033.

In contrast, the sensor according to amended claim 1 is adapted for authenticity identification of luminescent signets on documents transported in a transport direction relative to the scanning line at high speed, wherein the high speed in the transport direction varies from 0 to

4 m/s. This means, as set forth in new claim 31 for example, that the high speed is not constant i.e. it varies and takes any non-zero value in the interval from 0 to 4m/s. Most preferably, the speed in the transport direction varies from 1.5 m/s to 4 m/s.

As discussed in Features (1.) and (7.) of the “Features of the Invention” set forth on pages 5-7 of the specification, the high speed in the transport direction varies from 0 to 4 m/s. This of course results in intensity variations and, due to the non-linear physical properties of luminescence, this may cause saturation effects and low signal situations. All these problems have been overcome by the sensor of amended claim 1. In particular, this has been possible by illuminating the fluorescent authenticity feature at the excitation wavelength with an excitation pulse and wherein a response pulse following the excitation pulse is detected with a defined time delay, as required by claim 1.

In summary, Applicant respectfully submits that the surprising solution of amended claim 1 is inventive in view of the prior art. A combination of Oshima et al. and Kaule et al. is not possible because of the substantial different effects and the consequences disclosed therein, as discussed in detail above. Even if one may take into account a combination theoretically, this would not result in the sensor presently claimed by claim 1, which is a high speed transport sensor. As proven by Malmberg '033, the prior art merely suggests a detecting apparatus using the up-conversion effect when the document is in rest. Last, but not least, none of the prior art documents suggests a varying speed during detection where the speed takes any non-zero value in the interval between 0 and 4 m/s.

Consequently, Applicant also respectfully submits that the §103(a) rejection to claim 1 and the claims dependent therefrom should be withdrawn.

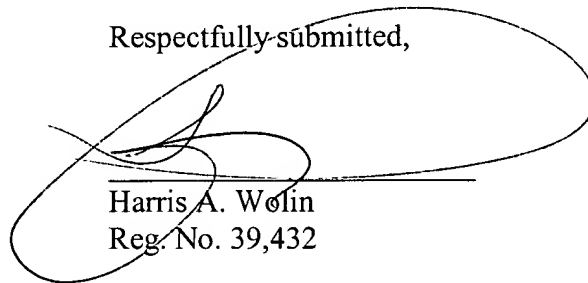
Newly added dependent claims 35-37 (see “Features (4.) and (5.) from page 6 of the specification) are directed to the size of the scanning line compared to the size of the signet. In view of the low intensity up-conversion effect, it is considered as particularly inventive to provide a sensor which is adapted for detection of a signet having a dimension smaller than the size of the scanning line such that the signet is detected anywhere within the scanning line.

A further preferred embodiment of a sampling method is claimed in new claim 38 (see “Feature (7.)”, which is dependent from pending claim 8.

In view of the above amendments and remarks, it is believed that claims 1, 2 and 6-38, consisting of independent claim 1 and the claims dependent therefrom, are in condition for allowance. Passage of this case to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper, including \$90 for five (5) excess total claims, may be charged on Deposit Account 50-1290.

Respectfully submitted,

A large, stylized handwritten signature in black ink, which appears to be "Harris A. Wolin", is written over a horizontal line. The signature is enclosed within a large, loopy oval shape.

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